

U.S. Application No. 10/613,689
Filed: July 3, 2003

Amendments to the Claims

This listing of claims will replace all prior versions and listings of claims in the application.

List of Claims:

1 – 18. (Cancelled)

19. (Currently amended) An apparatus for placing packaging material in a predetermined position relative to an array of articles conveyed by an article conveyor in a first direction of travel at a first velocity, the packaging material having cells for receiving the articles, the apparatus comprising:

a packaging material conveyor adapted for receiving the packaging material, disposed for conveying a continuous sequence of ones of the packaging material at a second velocity in a second direction of travel that is substantially perpendicular to the first direction of travel of the article conveyor;

a packaging material accelerator adapted and disposed for receiving said continuous sequence of ones of the packaging material from said packaging material conveyor at said second velocity, accelerating to a third velocity and projecting in a third direction of travel that is substantially perpendicularly to the first direction of travel of the article conveyor onto ones of the array of articles, whereby the packaging material is translated downward in a straight vertical line; and

wherein said packaging material conveyor and said packaging material accelerator are synchronized with respect to the velocities of one another and with respect to the velocity of the article conveyor such that the articles of the array are received within respective cells.

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20. (Previously presented) The apparatus of claim 19, wherein the packaging material conveyor receives the packaging material as a collapsed blank and wherein the apparatus further comprises an erecting mechanism having erecting elements disposed adjacent said packaging material conveyor adapted for erecting the cells of the packaging material as the packaging material is translated by said packaging material conveyor.

21. (Previously presented) The apparatus of claim 20, wherein said erecting elements include at least one reciprocating member adapted for engaging at least one portion of the packaging material while maintaining a perpendicular orientation with respect to said second direction of travel.

22. (Previously presented) The apparatus of claim 21, wherein said at least one reciprocating member travels in a curvilinear path.

23. (Previously presented) The apparatus of claim 22, wherein said curvilinear path is circular.

24. (Previously presented) The apparatus of claim 22, wherein said curvilinear path is oval-shaped.

25. (Previously presented) The apparatus of claim 20, wherein said erecting mechanism includes an adhesive mechanism adapted for applying an adhesive to the packaging material during erection of the cells.

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26. (Previously presented) The apparatus of claim 19, wherein a terminal portion of said packaging material conveyor is disposed in staggered, overlapping relationship with respect to said packaging material accelerator.
27. (Cancelled)
28. (Previously presented) The apparatus of claim 19, wherein said packaging material accelerator is adapted and disposed for accelerating said ones of said packaging material to said third velocity which is approximately 3.25 to 5 times greater than said second velocity.
29. (Previously presented) The apparatus of claim 19, wherein the packaging material accelerator is adapted for being advanced or retarded so as to synchronize placement of the packaging material with respect to the array.
30. (Previously presented) The apparatus of claim 19, wherein said packaging material accelerator includes at least one endless belt having a working reach terminating proximate the article conveyor disposed for intersection with top regions of the articles.
31. (Previously presented) The apparatus of claim 19, further comprising a compression mechanism for pressing the placed packaging material downward more fully into place.

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32. (Previously presented) The apparatus of claim 19, further comprising a control system for effecting the synchronization of said packaging material conveyor, said packaging material accelerator and the article conveyor.

33. (Previously presented) The apparatus of claim 32, wherein said control system synchronizes positions of the packaging material translated by the packaging material conveyor and said packaging material accelerator with respect to positions of the arrays of articles translated by the article conveyor.

34. (Previously presented) The apparatus of claim 32, wherein the control system includes

at least one article array position detector for determining positions of the article arrays;

at least one packaging material detector for determining positions of the packaging material;

at least one controller for controlling at least one of said packaging material conveyor, said packaging material accelerator and said article conveyor; and

a central processor adapted for receiving input parameters including input from said at least one article array position detector and said at least one packaging material detector and for operating said at least one controller.

35. (Previously presented) The apparatus of claim 20, further comprising:
a control system including

at least one packaging material detector for determining positions of the packaging material;

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at least one controller for controlling at least one of said packaging material conveyor and said at least one reciprocating member; and
a central processor adapted for receiving input parameters including input from said at least one packaging material detector and for operating said at least one controller.

36. (Previously presented) The apparatus of claim 20, further comprising:

a control system including

at least one article array position detector for determining positions of the article arrays;

at least one packaging material detector for determining positions of the packaging material;

at least one controller for controlling at least one of said packaging material conveyor, said packaging material accelerator, said at least one reciprocating member and said article conveyor; and

a central processor adapted for receiving input parameters including input from said at least one article array position detector and said at least one packaging material detector and for operating said at least one controller for controlling at least one of said packaging material conveyor, said packaging material accelerator, said at least one reciprocating member and said article conveyor.

37. (Previously presented) An apparatus for placing packaging material in a predetermined position relative to an array of articles conveyed by an article conveyor in a first direction of travel at a first velocity, the packaging material having cells for receiving the articles, the apparatus comprising:

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a packaging material conveyor and a packaging material accelerator both disposed having a second direction of travel in a vertical straight line with respect to one another and substantially perpendicular to the first direction of travel of the article conveyor,

said packaging material conveyor adapted for receiving the packaging material in a substantially flat collapsed condition and conveying a continuous sequence of ones of the packaging material at a second velocity in said second direction of travel, and

said packaging material accelerator adapted for receiving said continuous sequence of ones of the packaging material from said packaging material conveyor at said second velocity, accelerating to a third velocity and projecting onto ones of the array of articles whereby said packaging material conveyor and said packaging material accelerator translate said packaging material downward in a straight line; and

an erecting mechanism having erecting elements disposed adjacent said packaging material conveyor adapted for erecting the cells of the packaging material as the packaging material is translated by said packaging material conveyor;

wherein said packaging material conveyor and said packaging material accelerator are synchronized with respect to the velocities of one another and with respect to the velocity of the article conveyor such that the articles of the array are received within respective cells.

38. (Previously presented) The apparatus of claim 37, wherein said erecting elements include at least one reciprocating member adapted for engaging at least one

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portion of the packaging material while maintaining a perpendicular orientation with respect to said second direction of travel.

39. (Previously presented) The apparatus of claim 38, wherein said at least one reciprocating member travels in a curvilinear path.

40. (Previously presented) The apparatus of claim 39, wherein said curvilinear path is circular.

41. (Previously presented) The apparatus of claim 39, wherein said curvilinear path is oval-shaped.

42. (Previously presented) The apparatus of claim 37, wherein said erecting mechanism includes an adhesive mechanism adapted for applying an adhesive to the packaging material during erection of the cells.

43. (Previously presented) The apparatus of claim 37, wherein a terminal portion of said packaging material conveyor is disposed in staggered, overlapping relationship with respect to said packaging material accelerator.

44. (Cancelled)

45. (Previously presented) The apparatus of claim 37, wherein said packaging material accelerator is adapted for accelerating said continuous sequence of ones of the

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packaging material to said third velocity which is approximately 3.25 to 5 times greater than said second velocity.

46. (Previously presented) The apparatus of claim 37, wherein the packaging material accelerator is adapted for being advanced or retarded so as to synchronize placement of the packaging material with respect to the array.

47. (Previously presented) The apparatus of claim 37, wherein said packaging material accelerator includes at least one endless belt having a working reach terminating proximate the article conveyor disposed for intersection with top regions of the articles.

48. (Previously presented) The apparatus of claim 37, further comprising a compression mechanism for pressing the placed packaging material downward more fully into place with respect to the array.

49. (Previously presented) The apparatus of claim 37, further comprising a control system for effecting the synchronization of said packaging material conveyor, said packaging material accelerator and the article conveyor.

50. (Previously presented) The apparatus of claim 49, wherein said control system synchronizes positions of the packaging material translated by the packaging material conveyor and said packaging material accelerator with respect to positions of the arrays of articles translated by the article conveyor.

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51. (Previously presented) The apparatus of claim 49, wherein the control system includes

at least one article array position detector for determining positions of the article arrays;

at least one packaging material detector for determining positions of the packaging material;

at least one controller for controlling at least one of said packaging material conveyor, said packaging material accelerator and said article conveyor; and

a central processor adapted for receiving input parameters including input from said at least one article array position detector and said at least one packaging material detector and for operating said at least one controller.

52. (Previously presented) The apparatus of claim 38, further comprising:

a control system including

at least one packaging material detector for determining positions of the packaging material;

at least one controller for controlling at least one of said packaging material conveyor and said at least one reciprocating member; and

a central processor adapted for receiving input parameters including input from said at least one packaging material detector and for operating said at least one controller.

53. (Previously presented) The apparatus of claim 37, further comprising:

a control system including

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at least one article array position detector for determining positions of the article arrays;

at least one packaging material detector for determining positions of the packaging material;

at least one controller for controlling at least one of said packaging material conveyor, said packaging material accelerator, said at least one reciprocating member and said article conveyor; and

a central processor adapted for receiving input parameters including input from said at least one article array position detector and said at least one packaging material detector and for operating said at least one controller for controlling at least one of said packaging material conveyor, said packaging material accelerator, said at least one reciprocating member and said article conveyor.

54. (New) The apparatus of claim 19, wherein said packaging material conveyor comprises a pair of endless conveyor chains spaced apart from one another, each having at least one lug, and disposed such that said at least one lug will engage an end portion of an upper edge of the packaging material.

55. (New) The apparatus of claim 54, wherein said pair of endless conveyor chains are disposed at right angles with respect to one another and ones of said at least one lug are oriented to support the packaging material in both a transverse and a longitudinal plane.

56. (New) The apparatus of claim 37, wherein said packaging material conveyor comprises a pair of endless conveyor chains spaced apart from one another, each

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having at least one lug, and disposed such that said at least one lug will engage an end portion of an upper edge of the packaging material.

57. (New) The apparatus of claim 56, wherein said pair of endless conveyor chains are disposed at right angles with respect to one another and ones of said at least one lug are oriented to support the packaging material in both a transverse and a longitudinal plane.